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PATENTREMARKS

Reconsideration and continued examination is respectfully requested in view of the amendments and remarks.

Examiner's Telephonic Interview

The Applicants wish to thank the Examiner for the telephonic interview conducted with the Applicants' representatives on September 11, 2003. During that interview, the Examiner acknowledged that the Lehrke reference did not disclose a heater with sensors that were only in direct contact with the fluid as claimed in claim 19 and its dependencies as discussed below. Additionally, the Examiner agreed that while the amendment submitted May 7, 2003 with the new claim limitation of an "inside tube being heated along its entire length" as recited in previously amended claims 1, 29, and 34 may have introduced new matter into the application, that amending these claims to state that the "inside tube being heated along its continuous length" would not introduce new matter into the application and should place these claims and their respective dependencies in a condition for allowance. In response, Applicants have amended claims 1, 29, and 34 to recite the limitation that the "inside tube is heated along its continuous length".

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PATENTDisposition of the Claims.

Claims 1-34 are pending in the instant application. Specifically, claims 1-34 have been rejected as introducing new matter into the application. Further, the Examiner has maintained his rejection of claims 1-34 as being either anticipated or obvious in view of the prior art. Finally, claim 23 appears to remain rejected as being indefinite.

Previous Formal Rejection.

The Examiner is respectfully requested to acknowledge the Applicants' previous amendment and arguments in support thereof to claim 23. The Examiner had rejected claim 23 under 35 U.S.C. §112, second paragraph, as being indefinite.

In response, Applicants amended claim 23 to more clearly point out and distinctly claim the Applicants' invention as explained on page 11 of the response to the first Office Action submitted on May 7, 2003.

Since the Examiner did not address the Applicants' amended claim 23, Applicants assume that claim 23 now complies with 35 U.S.C. §112, second paragraph, and acknowledgement that the rejection has been withdrawn by the Examiner is respectfully requested.

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PATENTSummary of Formal Rejections

The Examiner has rejected claims 1-34 under 35 U.S.C. §112, first paragraph, as introducing new matter which the Examiner alleges was not disclosed in the specification at the time the application was filed.

Specifically, the Examiner contends that the application originally filed does not disclose that the "inside tube is heated along its entire length" or that the "sensor is in direct sensing contact with only said fluid". As agreed in the telephonic interview with the Examiner, the Applicants have either amended the claims or have made arguments in support of the Applicant's position. In particular, the application as originally filed does disclose that the sensors are in direct sensing contact with only the fluid. See specification page 13, lines 3-4; which states "Preferably, sensor 56 is placed substantially in fluid 18 flow stream, but not in contact with inside tube 30" (Emphasis added). See also Figures 6 and 7. Therefore, claim 19 which was amended to include the limitation that the sensor was only in contact with the fluid flow stream does not introduce new matter into the application and the Examiner is respectfully requested to withdraw this rejection to independent claim 19 and its related dependencies.

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Finally, claims 1, 29, and 34 which contained the limitation that the "inside tube is heated along its entire length" have been amended in accordance with the Examiner's recommendation and are believed to be allowable including the claims dependent therefrom as discussed in greater detail below.

Summary of prior art rejections.

The Examiner has rejected claims 1-6, 8-11, 13-14, 17, 19, 20, 22, 24-27, and 29-34 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 4,501,952 to Lehrke ("Lehrke"). Further, the Examiner has rejected claim 7 under 35 U.S.C. §103(a) as being unpatentable over the Lehrke reference in view of U.S. Patent 6,068,703 to Chen et al ("Chen"). Additionally, the Examiner has rejected claims 12, 15, 16, and 18 under 35 U.S.C. §103(a) as being unpatentable over Lehrke. Further, the Examiner has rejected claim 21 under 35 U.S.C. §103(a) as being unpatentable over the Lehrke reference taken in view of U.S. Patent 6,104,011 to Juliano ("Juliano"). Finally, the Examiner has rejected claims 21, 23, and 28 under 35 U.S.C. §103(a) as being unpatentable over the Lehrke reference taken in view of the U.S. Patent 5,178,651 to Balma et al. ("Balma").

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Applicant's Newly Amended Claims are Not Anticipated By the  
Lehrke Reference.

The Examiner has rejected claims 1-6, 8-11, 13-14, 17, 19, 20, 22, 24-27, and 29-34 as being anticipated by the Lehrke reference.

The Examiner contends that Lehrke discloses a fluid heat exchanger with an outside tube placed around an inside tube defining a small passageway of annular cross section comprising a thermistor for monitoring and controlling the temperature of the fluid. The Examiner further contends the Lehrke reference discloses that the inner tube includes a heater coil placed within the inner tube and that a helically coiled wire is wrapped around the inner tube. Additionally, the Examiner asserts that even though it is not explicitly disclosed in Lehrke, the Examiner considers a microprocessor as commonplace in the art and thus implicitly disclosed by Lehrke. Finally, the Examiner states that heating thermistors, resistance sensors and thermocouples are considered to be equivalents and therefore included in the disclosure of Lehrke.

A review of the Lehrke reference reveals that the reference discloses that the inside tube has at least two straight heater coils placed within the tube. See column 3, lines 5-10 and Figures 1 and 2. The reference further discloses that the heater coils are not capable of bending and, as such, they are

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not capable of placement within the "U" bend section of the tube, thereby allowing this "U" bend section to go unheated. Therefore, it appears that the inside tube of Lehrke is not continuously heated. Lehrke also discloses that the thermistor housing 36 is in physical contact with heating element 14. See column 4, lines 24-25; Figures 4A and 4B.

In response, the Applicants have amended independent claims 1, 29, and 34 to recite the limitation that the inside tube of the present invention is heated along its continuous length. Independent claim 19 was previously amended to include the limitation that the sensor placement of the present invention is only in contact with the fluid, and therefore not in physical contact with the heating element as disclosed in Lehrke. Applicants aver that no new matter has been introduced by virtue of these amendments. See specification page 3, lines 3 and 4; Figures 6 and 7 as noted above which sets forth that the specification as filed discloses the claim limitation relating to sensor placement. The claim limitation relating to the inside tube being heated along its continuous length was discussed in the Examiner interview and is shown in the specification on page 14, lines 16-17 which states that the cold portion "...generates heat radially outward along the length of fluid heat exchanger 12...". (Emphasis added). See also Figures

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1 and 6 which illustrates the cold portion along the inside tube is continuous throughout the length of the heat exchanger.

The newly amended limitations of an inside tube that is heated along its continuous length and a sensor arrangement that is not in physical contact with the heating elements of the inside tube is not anticipated by the Lehrke reference. As noted above, the Lehrke reference discloses that the heater coils located within the inside tube cannot be placed within the "U" bend in the tube and that the thermistors of Lehrke must be in physical contact with the heating element.

Because Lehrke teaches that the heater coils within the inside tube are straight and not capable of bending around the "U" bend section or other bends in the device the inside tube is not heated throughout its continuous length. In fact, only the straight portions of the inside tube of Lehrke are directly heated by the heater coils. Therefore newly amended independent claims 1, 29 and 34 are allowable over the cited prior art because the rapidly heatable inside tube of the claimed invention is heated throughout its continuous length.

Additionally, as discussed in the Examiner interview, the Lehrke reference discloses that the thermistor must be in physical contact with the heating element as noted above. Since the thermistor is in physical contact with the heater it is not capable of measuring an accurate temperature of the fluid as its

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readings are affected by the heat generated by the heater's direct contact with the temperature sensor.

In contrast, Applicants' sensors are capable of providing far more accurate temperature readings due to the direct contact of the sensor with the fluid and not the heating element. The sensors of the present invention are disposed directly in the fluid flow and only measure the temperature of the fluid and not the heating element. Therefore, previously amended claim 19 is allowable over the cited prior art because the temperature sensor of the claimed invention is in direct communication with only the fluid.

Accordingly, the Lehrke reference does not anticipate the points of novelty of the present invention; namely, a fluid heat exchanger having an inside tube heated throughout its continuous length and at least one temperature sensor disposed inside said outside tube such that the temperature sensor is in direct sensing communication with only the fluid flowing between the outside and inside tubes.

Based on the foregoing, the Examiner is respectfully requested to withdraw his rejection of independent claims 1, 19, 29, and 34 as being anticipated by Lehrke and indicate allowance thereof. Further, the Applicants respectfully request that dependent claims 2-6, 8-11, 13-14, 17, 20, 22, 24-27, 30-33 be



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allowed by virtue of their respective dependencies to the amended independent claims.

Applicants' Newly Amended Claim 7 is Patentable Over the Lehrke Reference in View of the Chen Reference.

The Examiner has rejected dependent claim 7 under 35 U.S.C. §103(a) as being unpatentable over Lehrke in view of Chen et al.

Specifically, the Examiner contends that Lehrke discloses the invention substantially as claimed in claim 7; however, the Examiner admits that the Lehrke reference does not explicitly disclose an electropolished finish to the surfaces of the channel. As noted above, independent claim 1 which claim 7 depends therefrom has been amended to overcome the prior art cited by the Examiner. As such, dependent claim 7 should be allowable by virtue of its dependency to independent claim 1.

Based on the foregoing, the Examiner is respectfully requested to withdraw his rejection of dependent claim 7 as being unpatentable over Lehrke taken in view of Chen et al.

Applicants' Newly Amended Claims are Patentable and Not Obvious in View of the Lehrke Reference.

The Examiner has rejected dependent claims 12, 15, 16, and 18 under 35 U.S.C. §103(a) as being obvious in view of Lehrke. Specifically, it is the Examiner's contention that Lehrke

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discloses the invention as substantially claimed except that instead of using a raised helical portion formed from the inside tube as is presently claimed, Lehrke uses a separate helical wire interposed between the inner and outer tubes which creates a raised region. The Examiner concludes that it would have been obvious to make the helical wire an integral part of the tube surface.

As noted above, claim 1 has been amended in order to distinguish the fluid heat exchanger of the present invention from the Lehrke reference. Therefore, dependent claims 12, 15, 16, and 18 would be allowable based upon their respective dependencies upon an allowable independent claim.

Additionally, the Applicants would like to respectfully point out to the Examiner that raised regions in dependent claims 12, 15, 16, and 18 are not the result of the helical wire being an "integral part of the tube surface" as the Examiner asserts. Rather, the raised regions are utilized in an alternative embodiment of the present invention "instead of wire". See specification page 10, line 15. Therefore, Applicants' raised regions are not the result of the combination of helical wire and the inside tube but rather the sole result of creating raised regions from the tube member itself. As such, the invention as claimed is not obvious when taken in view of Lehrke.

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Based upon the foregoing, the Examiner is respectfully requested to withdraw his rejection of claims 12, 15, 16 and 18 as being unpatentable when taken in view of Lehrke.

Applicant's Newly Amended Claim 21 is Patentable Over the Lehrke Reference In View Of the Juliano Reference.

The Examiner has rejected dependent claim 21 under 35 U.S.C. §103(a) as being unpatentable over Lehrke in view of Juliano.

Specifically, the Examiner contends that Lehrke discloses the invention substantially as claimed except that Lehrke does not explicitly disclose a temperature sensor within the inner tube as is disclosed by Juliano. As noted above, independent claim 19 which claim 21 depends therefrom has been amended to overcome the prior art cited by the Examiner. Accordingly, claim 21 is not obvious over Lehrke taken in view of Juliano.

Based on the foregoing, the Examiner is respectfully requested to withdraw his rejection of dependent claim 21 as being unpatentable over Lehrke taken in view of Juliano.

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PATENTClaims 21, 23, and 28 are Patentable Over the Lehrke ReferenceIn View Of the Balma Reference.

The Examiner has rejected dependent claims 21, 23, and 28 under 35 U.S.C. §103(a) as being unpatentable over Lehrke in view of Balma et al.

Specifically, the Examiner contends that Lehrke discloses, the invention substantially as claimed; however the Examiner admits the Lehrke reference does not show the sensor placement in a raised region of the outside tube as is depicted by Balma.

As noted above, independent claim 19 to which dependent claim 28 depends therefrom has been amended to overcome the prior art. Therefore, dependent claim 28 would be allowable based upon its respective dependency from an allowable independent claim.

Based on the foregoing, the Examiner is respectfully requested to withdraw his rejection of dependent claim 28 as being unpatentable over Lehrke taken in view of Balma et al.

Conclusion

By the present response, the Applicants have made remarks and amendments to the claims which comply with the verbal agreement reached between the Examiner and the Applicants' representatives during the aforementioned telephonic interview. Accordingly, the Applicants have amended independent claims 1,

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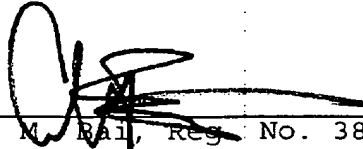
29, and 34 with language that the Examiner indicated would make these claims allowable by replacing the term "entire" with "continuous". Finally, claim 19 did not introduce new matter and is allowable as presently written.

Since none of the independent claims introduce new matter, Applicants have provided arguments for allowance of independent claims 1, 19, 29, and 34 based on certain distinguishing structural limitations not found in the Lehrke, Chen, Juliano, and Balma references. Additionally, dependent claims 2-18, 20-22, 24-28, and 30-33 are allowable by virtue of their respective dependencies to the above independent claims. Accordingly, the application is in a condition for allowance and expeditious notice thereof is earnestly solicited.

If the Examiner has any comments or suggestions which would place the application in still better condition for allowance, he is respectfully requested to call the undersigned attorney collect.

Respectfully submitted,

10/14/2003

  
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